**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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| Applicant: | Christopher J. Capece |
| Serial No.: | 10/686,451 |
| Examiner: | Lam, Dung Le |
| Art Unit: | 2617 |
| Filed: | October 15, 2003 |
| Confirmation No.: | 6861 |
| Title: | NEURAL NETWORK-BASED EXTENSION OF GLOBAL POSITION TIMING |

# APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Appellant now submits its brief in this appeal for which the Notice of Appeal was filed on January 13, 2010. Appellant believes that fees are not due, as payment was previously made. The Commissioner is authorized to charge Deposit Account No. 50-1482 in the name of Carlson, Gaskey & Olds for any additional fees or credit the account for any overpayment.

## Real Party in Interest

Lucent Technologies, Inc. is the Assignee of this application. Lucent Technologies, Inc. is part of Alcatel-Lucent USA.

## Related Appeals and Interferences

There are no related appeals or interferences.

**Status of the Claims**

Claims 1-22 are currently pending and on appeal.

Claims 1, 8 and 14 stand rejected under 35 U.S.C. §103 as being unpatentable over U.S. Published Application No. 2003/0012158 (the *Jin* reference) in view of U.S. Patent No. 7,299,214 (the *Martin* reference).

Claims 4-7, 9, 11-13 and 17-20 stand rejected under 35 U.S.C. §103 as being unpatentable over the *Jin* reference in view of the *Martin* reference and further in view of EP 631453 (the *Telia* reference).

Claims 2, 3, 10, 15 and 16 stand rejected under 35 U.S.C. §103 as being unpatentable over the *Jin* reference in view of the *Martin* reference and further in view of "Test Results and Analysis of a Low Cost Core GPS Receiver for Time Transfer Applications," IEEE International Frequency Control Symposium, J. Blake Bullock, et al. (the *Bullock* reference).

The Final Office Action does not contain any explicit rejection of claims 21 and 22.

**Status of Amendments**

There are no unentered amendments.

**Summary of Claimed Subject Matter**

There are two independent claims on appeal. Claims 1 and 14. Each of those is reproduced below including reference numbers from Figure 1 of the drawings contained in parentheses and references to the specification contained in brackets to comply with the rules regarding appeal briefs and to demonstrate how the claims read upon an example embodiment from the description.

> 1. A method of maintaining time information for a wireless communications base station (22, 30), comprising:
>
> using time information provided to a neural network (28) for generating a data set (26) that provides future time information {page 3, lines 12-25}; and

selectively using time information from the data set (26) for conducting a communication involving the base station {page 3, lines 7-12 and page 4, lines 3-6 and 12-14}.

14. A wireless communication device, comprising:

a neural network (28) that generates a data set (26) for providing future time information {page 3, lines 12-14}; and

a base station controller (22) that determines time information from a global position system (GPS) (24) source of time information and uses the data set (26) for obtaining time information if the GPS source is unavailable to the base station controller {page 3, lines 3-4 and 15-17}.

**Grounds of Rejection to be Reviewed on Appeal**

Claims 1, 8 and 14 stand rejected under 35 U.S.C. §103 as being unpatentable over U.S. Published Application No. 2003/0012158 (the *Jin* reference) in view of U.S. Patent No. 7,299,214 (the *Martin* reference).

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Claims 2, 3, 10, 15 and 16 stand rejected under 35 U.S.C. §103 as being unpatentable over the *Jin* reference in view of the *Martin* reference and further in view of "Test Results and Analysis of a Low Cost Core GPS Receiver for Time Transfer Applications," IEEE International Frequency Control Symposium, J. Blake Bullock, et al. (the *Bullock* reference).

**ARGUMENT**

There is no *prima facie* case of obviousness. The Examiner's proposed combination of references cannot be made because the proposed modification to the primary reference would completely change its principle of operation and remove an intended feature from it. While the Examiner might contend that it is "a substitution" that provides "reasonably predictable" results, that is not the case where a proposed modification requires a wholesale redesign of the principle of

operation of the primary reference. One of the guardians against improper hindsight reasoning is that a proposed modification cannot be made if it involves changing the principle of operation of that reference. Another guardian against improper hindsight reasoning is that a proposed modification cannot be made when it removes an intended feature from a reference. In this case, the Examiner's proposed combination does both and, therefore, the combination cannot be made. Even if the combination could be made, the result is not what the Examiner contends. There is no *prima facie* case of obviousness and all rejections under 35 U.S.C. §103 must be reversed.

**The Proposed Modification to the *Jin* Reference Cannot be Made.**

In this case, the Examiner proposes to combine the *Jin* reference with the *Martin* reference. The proposed combination cannot be made and the rejection must be reversed.

The *Jin* reference discloses an arrangement in which one base station (BTS) includes a global positioning system (GPS) device and the one BTS distributes the GPS timing information over an Ethernet connection among several BTSs connected to the one that has the GPS device. For example, paragraph 0008 on page 1 states:

> A telecommunication network is provided utilizing gigabit ethernet protocols and media. A global positioning system (GPS) and holdover stable oscillator (HSO) are installed aboard one of a plurality of base stations. The single GPS and HSO are used to synchronize all the base stations within the network by transmitting a clock signal via the gigabit ethernet media to each base station. The gigabit Ethernet signal is tapped by a clock recovery circuit, present in each base station, and the recovered signal serves as the master clock signal for the base station as well as a reference clock for the transmit and receive section.

Paragraph 0028 on page 3 teaches:

> For synchronization, a master clock or timing signal that is generated by a Global Positioning Receiver in one Base Station is conveyed to other base stations controlled by the same MSC. Currently, all base stations have a GPS and a holdover oscillator, all synched to the GPS time. The present invention eliminates the need for a GPS receiver and holdover stable oscillator in each Base Station by tapping the incoming gigabit ethernet signal and recovering an accurate

> synchronizing signal. A single GPS receiver and HSO is installed in one Base Station and utilized to synchronize other nearby Base Stations.

If there is no GPS signal available over the Ethernet connection, a clock recovery circuit at each connected BTS takes a data stream off the Ethernet connection and uses transitions of the data stream to "recover" the clock signal from the one BTS that includes the GPS device and a special oscillator to provide the clock signal. This is described, for example, in paragraphs 0037 and 0038 on page 4, which are quoted here.

> [0037] If it is determined that the GPS clock signal is not available, the process proceeds to step 606, which illustrates tapping the gigabit data stream being received into the base station and the signal being sent to a clock recovery circuit. The process continues to step 608, which depicts the clock recovery circuit processing the received signal. The process passes to step 610, which illustrates the recovered signal being sent to the transmit and receive local oscillators of the base station as a master clock signal. Additionally, the clock signal is sent to the base station transmitter section and locked reference clock for the receiver section. The process continues to step 600 to determine if a GPS clock signal is available.
>
> [0038] In the present invention, a base station, utilizing a gigabit ethernet, is synchronized with mobile switching center clock by utilizing the incoming data stream from the network. The system clock is recovered from transitions of the data stream. A follow up PLL circuit cleans up the phase noise caused by data rising or falling edge jitters. The cleaned up clock signal serves as the master clock for the base station as well as the reference clock for the transmitter section and locked reference clock for the receiver section. The VCXO is utilized in the PLL circuit because of its low phase noise and excellent frequency stability.

If one were to make the substitution suggested by the Examiner (e.g., to substitute in *Martin's* predicted values of a "numeric data time flow"), in place of the clock signal recovery technique described in the *Jin* reference, that would completely change the principle of operation of the arrangement in the *Jin* reference. Such a modification cannot be made according to MPEP 2143.01(VI). Replacing the clock signal recovery technique of the *Jin* reference with *Martin's* predicted values of a "numeric data time flow" completely changes the principle of operation in

the *Jin* reference and there is no *prima facie* case of obviousness because the Examiner's proposed combination cannot be made.

Another reason why the proposed combination cannot be made is that it would remove an intended feature from the *Jin* reference. As quoted above, an intended feature of the primary reference is to tap the gigabit data stream, provide that to the clock recovery circuit and use the local oscillators of the base station if the GPS clock signal is not available. That feature would be eliminated if the proposed modification to the *Jin* reference were made. The Examiner proposes to eliminate the function of the local oscillators of the base station in the *Jin* reference. The Examiner also proposes to remove the function of the clock recovery circuit by eliminating the tapping of the gigabit data stream and instead substituting in *Martin's* teachings. This is a wholesale redesign of the *Jin* reference that eliminates the intended features of that reference. Such a modification is not permissible when attempting to manufacture a *prima facie* case of obviousness.

**The *Martin* Reference Does Not Teach Time Information.**

Even if it were possible to make the proposed combination, the *Martin* reference does not teach time information of the type that would be of any use in the *Jin* reference. The "numeric data time flow" of the *Martin* reference is not "time" information of the type used for purposes of controlling communications by a wireless communication base station. Instead, that data flow is a "financial data time flow" (column 2, lines 44-45). Whatever the "numeric data time flow" information is in the *Martin* reference, it has no relevance or usefulness in the context of the *Jin* reference. The "time flow" is, at best, the flow of the numeric data over time. That is not the same thing as time in the sense of a time of day or GPS time information.

When one considers Figure 1 of the *Martin* reference, for example, past values of a numeric data "time flow" are shown at 22. The predictive values for the numeric data "time flow" provided by the neural network 12 are shown at 24. The illustration of Figure 1 in the *Martin* reference does not suggest at all how that information could in any way correspond to the type of time information that is used by a wireless communication base station. Moreover, the information in the *Martin* reference is intended to provide predicted ***text information*** that is somehow going to "improve the prediction of numeric data time flows" (column 2, lines 32-35).

Therefore, even if the proposed combination could somehow be made, the result is not consistent with what the Examiner contends. The *Martin* reference does not teach time information that would be of any use in the context of the *Jin* reference or for any other wireless communication base station for that matter. There is no possible *prima facie* case of obviousness.

A comprehensive and careful look at the *Martin* reference indicates that it has nothing to do with time information of the type that would be useful for operating a wireless communication base station. The Examiner's extrapolation from the *Martin* reference and attempt to incorporate it into the *Jin* reference (in a manner that is not permissible according to the boundaries placed upon an analysis under §103) indicates that the Examiner is taking words from the reference out of context and using them in a manner that is based purely upon hindsight reasoning for purposes of attempting to manufacture a *prima facie* case of obviousness.

**The rejection of claims 1, 8 and 14 must be reversed.**

The rejection of these claims is based on the improper combination of the *Jin* and *Martin* references. Given that the combination cannot be made and does not yield a result consistent

with Appellant's claims even if it could be made, there is no *prima facie* case of obviousness and the rejection must be reversed.

**The rejection of claims 4-7,9, 11-13 and 17-20 must be reversed.**

The rejection of these claims requires adding teachings from the *Telia* reference to the improper combination of the *Jin* and *Martin* references. The proposed addition of *Telia's* teachings does not remedy the defects in the proposed base combination and there is no *prima facie* case of obviousness. The rejection must be reversed.

Additionally, the Examiner's reliance upon the *Telia* reference is misplaced. That reference does not have anything to do with time information. Instead, the *Telia* reference is explicitly concerned with ***position*** information. There is a neural network mentioned in the *Telia* reference but that is used to provide a desired level of ***position*** information accuracy. Therefore, the teachings of the *Telia* reference have no relevance to the analysis in this case.

Moreover, the Examiner attributes features to the *Telia* reference that are not there. When rejecting claim 5, for example, the Examiner suggests that the *Telia* reference teaches "that the gathered time information extends over a selected period (C3 L9-18) and including comparing time information from the data set for a period corresponding to the selected period with the gathered time information; ... (C3 L46-C4 L9)." Final Office Action, pages 4-5. The *Telia* reference does not have anything to do with time information. It certainly does not have any teaching regarding "gathered time information [that] extends over a selected period," as suggested by the Examiner. There is nothing regarding any comparison of time information from a data set with gathered time information as suggested by the Examiner, either. The *Telia* reference simply provides no basis for the Examiner's position in this case.

Similarly, when rejecting claim 9, the Examiner suggests that an "initialization time value in using a data set until an external source of time" is available can somehow be found in the *Telia* reference. That is an unfounded position. The *Telia* reference contains no teaching whatsoever regarding generating time information nor an external source of time information.

When rejecting claims 12-13 and 19-20, the Examiner incorrectly suggests that the length of a data set is "purely dependent on the applications and preferences." The Examiner fails to recognize that the ability to achieve the result recited in claims 12-13 and 19-20 far exceeds the capabilities of systems that existed prior to Appellant's invention. The ability to achieve that result is unique to Appellant's claimed invention. One skilled in the art could not derive that from the *Jin* reference for example. Even the teachings of the *Martin* reference and the *Telia* reference do not provide any suggestion for achieving such a result. This feature of Appellant's invention is completely missing from the cited references and there is no basis for the Examiner's assumption.

**The rejection of claims 2, 3, 10, 15 and 16 must be reversed.**

The rejection of these claims is based on the proposed addition of the *Bullock* reference to the proposed combination of the *Jin* and *Martin* references. The *Bullock* reference does not remedy the defects in the proposed base combination of *Jin* and *Martin*. It is not possible to make the base combination and not possible to add the teachings of the *Bullock* reference, either. There is no *prima facie* case of obviousness and the rejection must be reversed.

Additionally, the *Bullock* reference does not add anything of any substance to the Examiner's improper combination of the *Jin* and *Martin* references. On page 7 of the Office Action, the Examiner suggests that somehow the *Bullock* reference would teach generating another data set for a later time interval merely because the *Bullock* reference teaches that GPS

signals may be lost. Teaching a problem does not in any way suggest the solution, let alone the specific solution of Appellant's claims. In other words, the Examiner's rejection of claims 2 and 15 is based purely on hindsight reasoning because the references do not even teach what the Examiner suggests. The *Bullock* reference identifying the fact that GPS signals may be lost does not in any way teach or suggest the claimed inventions of claims 2 and 15.

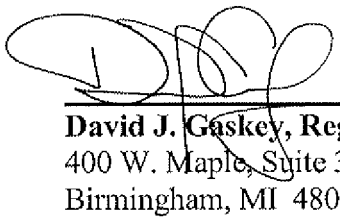
When rejecting claim 10, the Examiner again makes a wholesale redesign proposal to the *Jin* reference. Instead of using the type of timing information that the *Jin* reference relies upon, the Examiner suggests inserting GPS information when that is not available. The *Bullock* reference does not provide any teaching for using GPS time information as an external source of time information for a neural network as suggested by the Examiner. The rejection has no basis in the references and is, in fact, contrary to the teachings of the *Jin* reference. The rejection must be reversed.

## CONCLUSION

The proposed modification to the *Jin* reference cannot be made. Even if it could, the *Martin* reference does not teach what the Examiner suggests. Therefore, there is no possible *prima facie* case of obviousness against any of Appellant's claims. All rejections under 35 U.S.C. §103 must be reversed.

**Respectfully submitted,**

**CARLSON, GASKEY & OLDS, P.C.**



**April 13, 2010**
**Date**

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## CLAIMS APPENDIX

1. A method of maintaining time information for a wireless communications base station, comprising:

using time information provided to a neural network for generating a data set that provides future time information; and

selectively using time information from the data set for conducting a communication involving the base station.

2. The method of claim 1, wherein the data set is useful for a first time interval and including generating another data set for a second, later time interval.

3. The method of claim 2, including repeatedly generating another data set for subsequent time intervals.

4. The method of claim 1, including

gathering time information from an external source;

inputting the gathered time information to the neural network; and

generating the data set based upon the inputted time information.

5. The method of claim 4, wherein the gathered time information extends over a selected period and including

comparing time information from the data set for a period corresponding to the selected period with the gathered time information; and

changing at least one characteristic of the neural network when the data set time information does not correspond to the gathered time information within a selected range.

6. The method of claim 5, including changing the characteristic of the neural network by changing at least one of a number of layers in the neural network, a number of neurons in the neural network or a complexity factor of the neural network.

7. The method of claim 5, including repeatedly performing the steps of comparing and changing until the data set time information corresponds to the gathered time information within the selected range.

8. The method of claim 1, including

receiving time information from an external source;

determining when the external source time information is not available; and

using the data set for time information when the external source time information is not available.

9. The method of claim 8, including using an initialization time value and the data set to generate time information until the external source time information becomes available.

10. The method of claim 8, wherein the external source time information comprises global position system time information.

11. The method of claim 1, wherein the data set comprises a plurality of coefficients for generating future time information based upon a start time.

12. The method of claim 1, including providing at least more than 24 hours of future time information using the data set.

13. The method of claim 12, including providing at least two weeks of future time information using the data set.

14. A wireless communication device, comprising:

a neural network that generates a data set for providing future time information; and

a base station controller that determines time information from a global position system (GPS) source of time information and uses the data set for obtaining time information if the GPS source is unavailable to the base station controller.

15. The device of claim 14, wherein the data set is useful for a first time interval and the neural network generates another data set for a second, later time interval.

16. The device of claim 15, wherein the neural network repeatedly generates another data set for subsequent time intervals.

17. The device of claim 14, wherein the neural network receives an input of gathered time information and generates the data set based upon the inputted time information.

18. The device of claim 14, wherein the data set comprises a plurality of coefficients for generating future time information based upon a start time.

19. The device of claim 14, wherein the data set provides at least more than 24 hours of future time information.

20. The device of claim 19, wherein the data set provides at least two weeks of future time information.

21. The device of claim 14, wherein the data set corresponds to GPS time information.

22. The method of claim 1, wherein the data set corresponds to global position system time information.

## EVIDENCE APPENDIX

None.

## RELATED PROCEEDINGS APPENDIX

None.